

REMARKS

Applicant respectfully submits that all the claims presently on file are in condition for allowance, which action is earnestly solicited.

THE DRAWING

The Examiner objected to the drawings, stating that: "the longitudinal rifling grooves must be shown or the feature(s) canceled from the claim(s)."

Applicant has revised FIG. 1 to more clearly show the longitudinal rifling grooves 21, and respectfully requests that the corrected FIG. 1 be approved.

THE CLAIMS

CLAIM REJECTION UNDER 35 U.S.C. 112

Claim 11 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, as it is unclear to what is being claimed in regards to the "electric primer". Applicant has now amended claim 11 in satisfaction of 35 USC 112.

CLAIM REJECTION UNDER 35 U.S.C. 102

Claims 1, 7-9, and 11 were rejected under 35 U.S.C. 102(b) as being anticipated by GB Patent No. 1085045, hereinafter referred as the '045 reference or the GB patent. Applicants respectfully submit that the GB patent does not disclose all the elements and limitations of the

independent claim 1. Consequently, claims 7-9 and 11 are not anticipated under 35 U.S.C. 102, and the allowance of these claims and the claims dependent thereon is earnestly solicited. In support of this position, Applicant submits the following arguments:

A. Legal Standard for Lack of Novelty (Anticipation)

The standard for lack of novelty, that is, for "anticipation," is one of strict identity. To anticipate a claim for a patent, a **single prior source must contain** all its essential elements, and the burden of proving such anticipation is on the party making such assertion of anticipation. Anticipation cannot be shown by combining more than one reference to show the elements of the claimed invention. The amount of newness and usefulness need only be minuscule to avoid a finding of lack of novelty.

The following are two court opinions in support of Applicants' position of non anticipation, with emphasis added for clarity purposes:

- "Anticipation under Section 102 can be found only if a reference shows **exactly** what is claimed; where there are **differences** between the reference disclosures and the claim, a rejection must be based on obviousness under Section 103." *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).
- "**Absence** from a cited reference **of any element** of a claim of a patent negates anticipation of that claim by the reference." *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986), on rehearing, 231 USPQ 160 (Fed. Cir. 1986).

B. Brief Summary of the Present Invention

Prior to presenting substantive arguments in favor of the allowability of the claims on file, it might be desirable to summarize the present invention. An anti-personnel tank ammunition round, wherein the munition is designed for attacking groups of personnel in various ranges in marked contrast to defeating tanks, armored personnel carriers, aircraft or other vehicular targets. The described ammunition, much like a shotgun, is capable of dispersing a payload, upon exit from its gun tube and achieves maximum dispersion, by means of a canister made of plastic or aluminum, secured by obturators to the adaptor case of a cartridge holding a propellant. The canister breaks apart in flight after separation from the cartridge during launch to disperse the anti-personnel ammunition contained therein.

More specifically, the cartridge includes a base member at one end and an adapter case at an opposite end. A solid propellant is contained within the cartridge, and an electric primer is disposed within the propellant and affixed to the base member. A canister is secured to the adapter case, and canister contains a payload. The canister further includes a plurality of longitudinal rifling grooves that provide a rifled spinning movement to the canister during flight. The longitudinal rifling grooves weaken the structure of the canister, so that during flight, air pressure is exerted on a canister cap and a centrifugal force results from the rifled spinning movement, causing the canister to break apart and the payload to be dispersed.

C. Independent Claim 1 in Light of the GB Patent

Applicant will now present arguments in support of the allowance of independent claim 1, and the claims dependent thereon, over the GB patent. Representative claim 1, as amended, will now be discussed and in light of the GB patent.

D. Application of the Anticipation Standard to Representative Claim 1

D.1. The GB patent does not disclose a canister secured to the adaptor case of a cartridge.

As shown in FIGS. 1 and 2 of the GB patent, that are reproduced below for ease of reference, a projectile has a wall 4 and contains a distal propellant charge chamber and a proximal firing tube 7 that holds an ammunition or sub-projectiles. After launch, the whole projectile with the ammunition and propellant leave the launcher. Structurally, the projectile does not break apart during flight to disperse the ammunition. It relies on a separate fuze to cause the projectile to airburst in order to disperse the ammunition at some suitable point in its trajectory.

On the other hand, the present invention teaches an ammunition holding canister 16 that is made of plastic or aluminum, and secures to the adaptor case 14 of a cartridge 12 holding propellant and the canister is secured and held in place to the adaptor case of a cartridge by obturators 17 and 18. The canister separates from the cartridge at launch, and breaks apart during flight to disperse the anti-personnel ammunition.

Fig. 1

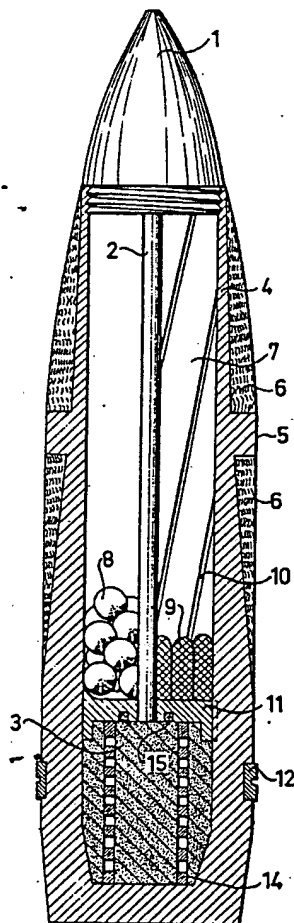
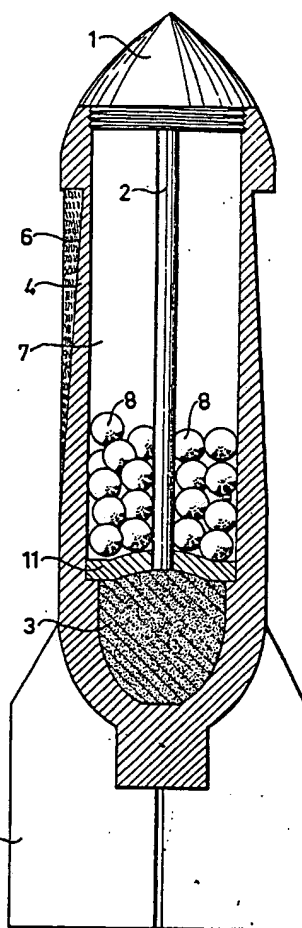


Fig. 2



D.2. The GB patent does not teach an electric primer disposed within the propellant and affixed to the base member, away from the canister.

The GB patent describes a time or proximity fuze connected to a **flash tube 2 which is placed inside a firing tube 7 holding the ammunition 8 or 9**. The flash tube is connected to a chamber in the distal portion of the projectile. The ammunition is separated from the rear chamber by a propelling disc 11. The rear chamber contains a propellant charge 3 that is ignited when the fuze is actuated.

The electric primer 15 of the present invention is located within the solid propellant (refer to FIG. 1), away from the canister 16 that holds the payload 20. The firing of the electric primer 15 thus has a maximum effect on the propellant, whereas in the GB patent the very limited exposure of the flash tube to the propellant will correspondingly reduce the effect, compromising its performance consistency.

D.3. The GB patent does not teach a canister that breaks apart during flight to disperse the payload.

In FIGS. 1 and 2, the GB patent illustrates a projectile wall with a trapezoidal cross-section in the side view, with the thinnest section in the proximal portion. The wall is made from suitable projectile material. The GB patent teaches the projectile wall is thinned out for weight reduction, but not to induce structural disintegration or breaking apart during flight. In fact it relies on a trigger from "a fuse which causes the mother projectile in a manner known per se to air burst at some suitable point in its trajectory".

The present invention teaches a full caliber canister of plastic or aluminum, with a front flat cap and a uniform wall thickness as shown in FIG. 1. "Upon exiting the tube, the air pressure on the closing cup coupled with the longitudinal grooves in the canister and centrifugal force caused by the rifled spinning breaks the canister apart, so dispensing the payload contained therein." As the canister is launched into flight, the propelling force from the back and the aerodynamic force acting on the front flat cap further weaken the canister wall of plastic or aluminum, such that it facilitates the breaking apart of the spinning canister while in flight without firing a fuze, and dispersing the anti-personnel ammunition over a wide area.

To conclude, independent claim 1 is allowable for not being anticipated by the GB patent, and thus the claims dependent thereon are also allowable, and such allowance is respectfully requested.

CLAIM REJECTION UNDER U.S.C. 103

Claims 1, 5 and 7-11 were rejected under 35 U.S.C. 103(a) as being unpatentable over GB Patent No. 1085045, in view of Johns in US Patent 3,906,860. Applicant respectfully traverses this rejection and submits that neither reference discloses the elements and features of the claims on file, whether considered individually or in combination with each other. To this end, Applicant respectfully submits the following arguments.

A. Legal Standards for Obviousness

The following legal authorities set the general legal standards in support of Applicants' position of non obviousness, with emphasis added for added

clarity:

- MPEP §2143.03, "All Claim Limitations Must Be Taught or Suggested: To establish prima facie obviousness of a claimed invention, **all the claim limitations must be taught or suggested by the prior art**. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "**All words in a claim must be considered** in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)."
- MPEP §2143.01, "The Prior Art Must Suggest The Desirability Of The Claimed Invention: There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (**The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a prima facie case of obvious was held improper.**). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. Al-Site Corp. v. VSI Int'l Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).
- "**Obviousness cannot be established** by combining the teachings of the prior art to produce the claimed invention, **absent some teaching or suggestion** supporting the combination." In re Fine, 837 F.2d at 1075, 5 USPQ2d at 1598 (citing ACS Hosp. Sys. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984)). **What a reference teaches** and whether it teaches toward or **away from the claimed invention** are questions of fact. See Raytheon Co. v. Roper Corp., 724 F.2d 951, 960-61, 220 USPQ 592, 599-600 (Fed. Cir. 1983), cert. denied, 469 U.S. 835, 83 L. Ed. 2d 69, 105 S. Ct. 127 (1984). "
- "When a rejection depends on a combination of prior art references, there must be **some teaching, suggestion, or motivation** to combine the references. See In re Geiger, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). "**Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation** to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See MPEP 2143.01; In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); In re Fine, 837

F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

- "With respect to core factual findings in a determination of patentability, however, the **Board cannot simply reach conclusions based on its own understanding or experience** -- or on its assessment of what would be basic knowledge or common sense. **Rather, the Board must point to some concrete evidence in the record** in support of these findings." See In re Zurko, 258 F.3d 1379 (Fed. Cir. 2001).
- "We have noted that **evidence of a suggestion, teaching, or motivation to combine** may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved, see Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996), Para-Ordinance Mfg. v. SGS Imports Intern., Inc., 73 F.3d 1085, 1088, 37 USPQ2d 1237, 1240 (Fed. Cir. 1995), although "the suggestion more often comes from the teachings of the pertinent references," Rouffet, 149 F.3d at 1355, 47 USPQ2d at 1456. The range of sources available, however, does not diminish the requirement for actual evidence. That is, **the showing must be clear and particular**. See, e.g., C.R. Bard, 157 F.3d at 1352, 48 USPQ2d at 1232. **Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence."** E.g., McElmurry v. Arkansas Power & Light Co., 995 F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cir. 1993) ("Mere denials and conclusory statements, however, are not sufficient to establish a genuine issue of material fact."); In re Sichert, 566 F.2d 1154, 1164, 196 USPQ 209, 217 (CCPA 1977)." See In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1999).
- "To prevent the use of hindsight based on the invention to defeat patentability of the invention, **this court requires the examiner to show a motivation to combine the references** that create the case of obviousness. In other words, **the examiner must show reasons** that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references **for combination in the manner claimed**." See In re Rouffet, 149, F.3d 1350 (Fed. Cir. 1998).
- The mere fact that references can be combined or modified does not render the resultant combination obvious **unless the prior art also suggests the desirability of the combination**. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, **there must be a**

suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.). See also In re Fritch, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992) (flexible landscape edging device which is conformable to a ground surface of varying slope not suggested by combination of prior art references).

- If the **proposed modification would render the prior art invention being modified unsatisfactory** for its intended purpose, **then there is no suggestion or motivation** to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

B. Application of the Obviousness Standard

B.1. The GB patent and Johns are not combinable.

While the GB patent teaches a projectile containing both a firing tube and a propellant chamber, with a flash tube centrally extending from the front conical cap through the firing tube to the propelling disc separating the firing tube from the propellant chamber, it does not teach an anterior ogival hollow member in the projectile that centrally supports a frontal shaped charge assembly with its own fuze and charge, such that on impact, the piezoelectric element 38 in the nose cap 36 functions the fuze 48. The fuze 48 detonates the bursting charge 54, causing the copper cone 52 to melt and penetrate the target.

On the other hand, Johns describes a dual purpose projectile for material and anti-personnel targets, without a distal chamber for the propellant and centrally placed flash tube through the firing tube, connecting the nose cap to the propelling disc for initiating the propulsion.

The flash tube and the shaped charge assembly with a fuze and a charge are in interference and are physically incompatible. Hence, these two

references cannot be properly combined. As a result, independent claim 1 and its dependent claims are allowable, and such allowance is respectfully requested.

B .2. The combination of the projectile in the GB patent and the dual purpose projectile in Johns does not yield the same or similar product as the present invention.

Since neither the GB patent nor Johns teaches a single canister with a flat cap that breaks apart in flight to disperse the anti-personnel ammunition inside, the combination of the GB patent and Johns does not yield the same or similar product as the present invention. The combination of the GB patent and Johns would be a dual purpose projectile with an anterior shaped charge assembly having its own fuze and charge, and a frontal nose cap to house the piezoelectric transducer to trigger the fuze upon target impact. Distal to the shaped charge assembly would be a hollow tubularly shaped body member holding the anti-personnel ammunition and equipped with annular bores which are selected to be open, resulting in a continuous release and low concentration of anti-personnel ammunition during flight. A centrally placed flash tube would be supported only by the propelling disc separating the anti-personnel ammunition in the hollow tubularly shaped body member and the propellant in the distal chamber.

The small nose cap, conical geometry of the shaped charge assembly and the hollow ogive member behind it transmit aerodynamic flight forces into compressive stress in the walls of the projectile making up the firing tube for the anti-personnel ammunition. It is quite difficult to induce failure in the conically shaped projectile walls by compressive stress. Whereas in the present invention

the anterior flat cap of the canister transmits the aerodynamic flight forces into bending shearing stress on the canister wall, which is also weakened by the longitudinal rifling grooves, to cooperate with the rifled spinning to induce the thin canister wall to break apart and dispose the anti-personnel ammunition. The ability of the canister to break apart in flight presents a simple and reliable solution to disperse the ammunition in the present invention.

It is noteworthy to mention that this method of delayed, binary mode of anti-personnel ammunition release results in a higher ammunition concentration and therefore more effective than the continuous release and low ammunition concentration limited by the combination of the GB patent and Johns, which could cause unwanted collateral damage.

Another variation to the combination of the GB patent and Johns is to use a fuze to blow holes in or destroy the projectile wall to disperse the anti-personnel ammunition. However, this would involve more complication and components. In addition, after the fuze is set off and the projectile wall breaks apart, the shaped charge assembly can no longer maintain a stable flight or its original trajectory, presenting a safety hazard.

As a result, the hypothetical combination of the teachings of the two cited references would yield a product that is quite different from the present invention taken as a whole. Claim 1 and the claims dependent thereon are thus allowable over the cited references.

CONCLUSION

All the claims presently on file in the present application are in condition for immediate allowance, and such action is respectfully requested. If it is felt for any reason that direct communication would serve to advance prosecution of this case to finality, the Examiner is invited to call the undersigned at the below-listed telephone number.

Respectfully submitted,

Date: 9/29/, 2004



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Enclosure: Proposed FIG. 1

THE DRAWING

Applicant respectfully submits herewith, as an appendix, a corrected FIG. 1, and respectfully requests that it be approved.